



# NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
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Remarks by

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
FIRST NATIONAL CONFERENCE ON THE PEACEFUL USES OF SPACE  
TULSA, OKLAHOMA  
MAY 26, 1961

Governor Edmondson, Friends:

It was a very real disappointment not to be able to help open this First National Conference on the Peaceful Uses of Space. It was necessary, however, for me to remain in Washington until the President's Message had been completed and sent to the Congress.

Senator Kerr and I had planned to fly out together, and it was a disappointment also in not being able to come to Tulsa on the same plane with him. Fortunately, when I got on the plane this afternoon in Washington, I found that Senator Monroney was also a passenger. He and I had a chance to talk about the great flight yesterday of NASA's X-15 experimental rocket plane at five times the speed of sound.

Perhaps I should point out for those Oklahomans who may not be aware of it that in the National Aeronautics and Space Administration we not only have the Project Mercury Freedom VII capsule and its pilot Astronaut Shepard for Senator Kerr, but also the X-15 and Test Pilot Joe Walker for Senator Monroney.

On arrival in Tulsa, I found that Senator Kerr had expected to talk with me on the plane about the desire of two fine, alert Oklahoma communities, Ada and Poteau, to set up Space Age educational exhibits. He was very unhappy this afternoon, when he tried to say what he had no chance to say on the plane--that he had to write me notes instead of making me a speech. It took no less than the Space Age to silence Senator Kerr, even temporarily, but all of us miss him here tonight and hope that he will quickly recover his voice.

On one matter of interest to Oklahoma, I have kept silent until now. This relates to the appointment of Jerrie Cobb as a consultant to the National Aeronautics and Space Administration. Recently, at one of our meetings with consultants in Washington, I asked Dr. Randolph Lovelace if he thought Jerrie could contribute to our program. He enthusiastically

endorsed the idea. I understand that Jerrie has now finished all of the physiological tests which were basic to the selection of NASA's seven astronauts. So I expect to ask her to serve as a consultant on the role of women in the national space program. Jerrie's father was an Air Force pilot. She, herself, has been flying since she was 12 years old.

No one could live in, or be associated with, Oklahoma for almost 10 years, as have my wife and I and our two children, without realizing that this is a land of tremendous space and boundless horizons. Oklahomans have the clear outlook of pioneers. They are capable of projecting into the challenging new frontier of space the competence, the willingness to experiment, the restlessness, and the personal courage and drive of the great Southwest.

I know that through your great universities and colleges, through the efforts of your leaders in every field, and through such activities as the Frontiers of Science Foundation of Oklahoma and this First National Conference on the Peaceful Uses of Space, you are determined to build here a modern, scientific, innovative culture that will furnish many of the leaders we need for the Space Age in the vigorous tradition which you have always maintained. Our national space effort needs these qualities. It needs Oklahoma and the Southwest.

We are fortunate to have the support of both our Senators, Senator Kerr as Chairman of the Senate Committee on Aeronautical and Space Sciences and Senator Monroney on the Appropriations Committee that handles the money. We are also fortunate to have the support of Congressman Carl Albert, who would have been Chairman of the House Committee on Science and Astronautics except for the fact that he is serving in so many other important capacities, including that of Whip of the House. It would have been a world's record if Oklahoma should have furnished our two distinguished Senators to serve aviation and space while also having in the House of Representatives Carl Albert as Chairman of the Committee on Science and Astronautics.

Let me say that, from having lived close to the ferment of the modern Oklahoma frontier, I have had no difficulty in feeling right at home on the space frontier or indeed in President Kennedy's "New Frontier." It was only necessary to change the habit of looking forward to the habit of looking outward.

Three and a half years ago, a short time in the history of even such a new state like Oklahoma, the Russians were clearly ahead of us in space. They had launched the first man-made earth satellite--Sputnik I. Since then, they have sent 12 vehicles into earth orbits, including the spaceship that carried Cosmonaut Gagarin around the globe. Although only one Soviet satellite is still in orbit, it is important to keep in mind that five of them weighed in the neighborhood of 10,000 pounds and that three of these large vehicles have been recovered from earth orbits.

In the same three and one-half years, the United States has mounted a determined, major effort in the field of space exploration. We have drawn together, in the National Aeronautics and Space Administration, more than seven laboratories and space-flight research centers. We have placed in orbit 39 satellites, of which 22 are still circling the world, with nine still transmitting signals and valuable scientific information about our space environment. And just two weeks ago--openly, before the eyes of the world--we conducted the first Project Mercury man-carrying suborbital flight.

During the period since Sputnik I, we have rapidly evolved the technology that made this giant stride possible. We have drawn heavily on the bank of scientific knowledge accumulated by centuries of telescopic observation of the phenomena of the universe, filtered through the veil of the earth's atmosphere. On this foundation, the United States has developed means of designing spacecraft that we have rocketed beyond the earth's atmosphere. Packed with electronic equipment, they have isolated, measured, and observed with more accuracy than could have been dreamed a decade ago the magnetic currents that surround the earth and the radiation that sweeps in vast "solar winds" from the sun through the universe.

We have made the tremendous step from observation and hypothesis to experimentation and measurement. Data gathered by our satellites and probes are radioed to earth. This enormous flow of information is being analyzed continuously by the most modern computer systems. We are distributing the results to scientists in every nation. Thus, we have achieved a position of open science, openly arrived at. Our policy is to spread the puzzles and problems, which every great new scientific advance generates, to the largest possible number of able and searching minds for interpretation and solution.

As an example of how this system works, Pioneer V was launched last year by a Thor-Able rocket to gather scientific data from deep space and to test communications over interplanetary distances. This deep-space probe weighed 94 pounds and contained two radio transmitters and receivers. In it were instruments to measure radiation streaming from the sun, the spatial distribution of energetic particles and medium-energy electrons and protons, the number and density of meteoric dust particles striking the probe, and the strength of magnetic fields. We were able to communicate with Pioneer V for a distance of 22 million miles, and through it confirmed the existence of an electrical ring current circling the earth at an altitude of 40 thousand miles, the existence of which had been speculated on by geophysicists for more than 50 years. Pioneer V also revealed that the boundary of the earth's magnetic field is twice as far from earth as had been previously supposed. It reported the first direct observation of pure cosmic rays at altitudes completely free of the earth's atmosphere from three million miles in space. All of this from one deep-space probe.

I could list many other achievements in this three-and-a-half-year period, such as the discovery of the Great Radiation Belts, now named the Van Allen Belts, for Dr. James Van Allen of the State University of Iowa, one of the eminent scientists working with the Space Administration. I could mention that our first weather satellite, Tiros I, completed more than 1,300 orbits of the earth and transmitted more than 22,000 pictures before we lost communication with it. I could go on to mention Echo I, that brightly twinkling, earth-orbiting balloon which has been seen by millions and which has proved the feasibility of using satellites to reflect radio and other electronic signals.

But I think I have made the point that the U.S. space effort has progressed swiftly in the three and one-half years since man launched the first artificial earth satellite.

In such a short time--while carrying out much of this activity--the work force of the National Aeronautics and Space Administration grew from 8,000 to 18,000. Our annual expenditures rose from \$145 million in 1959, our first year of operation, to what we estimate will be about \$760 million for 1961.

I believe it is fair to say that during this period the United States achieved first position in space science and technology and merited the confidence of the world scientific community.

In one major field, however, we did not make the effort necessary to achieve first position. This, unfortunately, was the area of building the large, high-thrust rocket boosters required to lift heavy payloads into space and to achieve sustained manned space flight.

The U.S.S.R. did make the necessary effort. It has reaped the benefit in worldwide acclaim.

So much for the past three and a half years. My own entry into this highly complex new dimension came three and a half months ago, when President Kennedy sent a message which I received while attending an Oklahoma City luncheon in honor of Senator Kerr. I can only surmise what went on in past years, but I know personally the intensity of work over the past 14 weeks.

There was the driving demand by the President that every facet of the requirements to recover our lost position be examined and evaluated.

There was the penetrating analysis of our past weaknesses by Vice President Johnson, based on his experience during his two years' service as Chairman of the Senate Committee on Aeronautical and Space Sciences, with the follow-up of Senator Kerr, who succeeded him as Chairman of that Committee.

There were the incisive and meaningful sessions with the Secretary of Defense and the Chairman of the Atomic Energy Commission to bring diverse elements into harmony in the form of a national space program.

There were the long and detailed presentations to the Director of the Budget so that he might test the validity of our conclusions and assimilate the facts that would permit the President to weigh the requirements for the space program against other urgent requirements of defense and national interest.

There was the decision of the President, announced March 24, that the key to retrieving our position lay in determining that we could no longer proceed with the Mercury one-man spaceship as if it were to be the end of our program but that we must--even in a tight budget situation--present to the Congress the urgent necessity for committing ourselves to giant boosters.

Funds were increased to speed up the Saturn C-2 booster and the large, single-chamber, 1.5-million-pound-thrust F-1 engine which will be a basic building block for Nova, the largest rocket we have yet programmed. That is to say, we shall use the F-1 engine as our basic building block unless the new decision of the President, announced yesterday--that we will parallel development of this liquid-fuel engine with a solid-fueled engine--produces a better and more powerful rocket that will utilize some type of solid propellant.

Thus, the first major decision of the new Administration in the field of space was to step up the big-boosters program to provide lift for larger and more advanced spacecraft.

The intensity of the effort pervading the past three and one-half months did not end for me with President Kennedy's first space decision on March 24. At the same time that we were presenting the new program to the Senate and the House Committees, the National Aeronautics and Space Council was being reorganized and the leadership of its chairman, Vice President Johnson, was coming increasingly into play.

The President asked the hard questions.

The Vice President demanded the work to provide the answers.

Those of us charged with getting the facts could see little difference between night and day, weekends and holidays.

We did manage to do the work! Based upon it, the President yesterday announced major new goals for the Nation and new programs to achieve them.

The National Aeronautics and Space Administration program is now increased to \$1,784 million, or by 61 percent. Space Administration expenditures for 1962 are now estimated at \$1,380 million, or an increase of 43 percent.

Further increases for big engines and big boosters, aggregating \$144 million, are included in the request made by the President yesterday. His request also provides an additional \$130 million for Apollo, a three-manned, earth-orbiting laboratory, which will later become a manned lunar-landing spacecraft. Sixty-six million dollars is requested for an accelerated effort in exploration of the environment around the earth, around the moon, and in the space between.

Funds are provided for a study of the problems of return to earth from flights around the moon at atmospheric-entry speeds as high as 25,000 miles per hour, which will generate extreme heat. Thorough studies of radiation problems will be conducted, including an analysis of solar activity over the past 50 years in order to predict, if possible, the periods of extreme radiation which manned space flight must avoid.

In President Kennedy's new request, there is an item of \$50 million to expedite development of an active communications satellite system and to demonstrate transatlantic television.

In the area of meteorological satellites, funds are increased to keep a Tiros satellite in orbit at all times and, in addition, to enable the Weather Bureau to develop without delay a worldwide meteorological satellite system based on the more advanced Nimbus satellite.

An additional \$15 million is provided to accelerate the F-1 engine program, and another \$58 million for long lead-time propulsion development facilities. The largest booster vehicle funded in this program is the Nova. Forty-eight million dollars is provided to start work on a liquid-fueled version of this giant booster.

However, the Department of Defense, through its Minuteman and Polaris developments, has great capability in the field of large solid-propellant rockets. Therefore, solid-propellant booster stages for the Nova vehicle will be developed by the Department of Defense in parallel with NASA's liquid-fueled stages. This means that both the liquid- and solid-propellant technologies will be driven forward at a rapid rate. As soon as the technical promise of each can be adequately assessed, one will be selected for final development and utilization in the manned space program.

Included in the request is an additional \$23 million for the Rover nuclear rocket engine.

From the above, it is clear that the President's requests, taken as a whole, establish a pattern of effort that adds up to a vigorous, well-rounded national space program. I might add that many Federal departments and agencies as well as many firms, universities, and private research organizations participate in it.

This program, to be successful, will require a sustained and highly paced national effort over a number of years.

To provide you with perspective on the large dimensions and stage-ratings of the Nova vehicle that will be used to land the Apollo spacecraft on the moon and return it to earth, listen to these figures:

The overall height of the completed rocket will be some 360 feet --60 feet taller than a football field is long, two-thirds the height of the Washington Monument.

The diameter at the base will be some 50 feet, and of the upper stages, some 25 feet.

In one version, the first stage will consist of eight clustered F-1 engines that will produce a total thrust of about 12 million pounds.

This version also calls for second and third stages fueled with liquid hydrogen and liquid oxygen.

What a rocket for three men to ride!

The Apollo spacecraft to carry the three men on the nose of this rocket will have its own propulsion system, retrorockets for soft lunar landing, and other rockets for take-off from the surface of the moon. It will weigh about 150,000 pounds.

Since the early days of World War II, the American people have faced many crises and have had the courage to make the hard decisions. The war effort was mounted and our arms were victorious. In the post-war world, our deepest hope and desire was that the people of all lands would share basic individual fulfillment in peace, freedom, justice, and continuing progress. We were confronted, instead, with the cruel reality of a powerful despotism bent on burying us, along with the fundamental tenets upon which our society rests and from which it draws its strength.

We Americans are a pragmatic people. We have always adopted new measures to meet new conditions. In the postwar period, major milestones were passed with: adoption of the Marshall Plan, the North Atlantic Treaty Organization with its military assistance program; the Berlin airlift; support of the United Nations action in Korea; the landing of troops in Lebanon; and others that you recall.

Now we are faced with another national requirement that will commit us for many years to a major undertaking in which second best has proved not good enough. All Oklahomans can be proud that at this First National Conference on the Peaceful Uses of Space, the position of the United States in the competition for scientific and technological supremacy is presented clearly at a time when the President is calling for the support of the Nation.

In conclusion, let me make it clear that all the effects of the national space program will not be confined to national prestige or to outer space itself. These effects will go beyond the impression they make in the minds of men around the world.

You as a citizen, as a worker, as a parent, as a patient in a hospital, will feel them in your daily life. Already our push into space has produced a ceramic that, when made into pots and pans, can be moved from the coldest freezer into the hottest flame without damage. Our study of foods best suited for space flight will lead to improved nutrition for the earthbound. Space research has created new materials, metals, alloys, fabrics, and compounds which have gone into commercial production. From our work in space vacuum and extreme temperatures have come new durable, unbreakable plastics that will have a wide variety of uses, such as superior plumbing and new types of glass.

Our scientists have devised minute instruments called sensors to gauge an astronaut's physical responses, to measure his heartbeat, brain waves, blood pressure, and breathing rate. These same devices could be attached to a hospital patient so that he could be watched by remote control. In the future every patient's condition could be recorded continuously and automatically at the desk of a head nurse.

More than 3,200 space-related products have been developed in the United States. They come from the 5,000 companies and research outfits now engaged in missile and space work. From this new industry will emerge new jobs that will provide new opportunities and help take up the slack of unemployment.

Those of us working in the national space program are convinced that a large part of our future as a nation is at stake in what we do in the vast regions beyond the earth's atmosphere. That is why we particularly appreciate the support of those of you who have come to this Conference in Tulsa to apply your minds to space, to understand its implications, and to make your own contributions to it.

Thank you very much.

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